

What is claimed is:

- 1 1. A semiconductive power cable composition comprising:
 - 2 a. a mixture of a high-temperature polymer and a soft polymer; and
 - 3 b. a conductive filler,
- 4 wherein a semiconductive cable layer prepared from the composition strippably
- 5 adheres to a second cable layer.
- 1 2. The semiconductive power cable composition of Claim 1, wherein the
- 2 semiconductive cable layer having a heat resistance of less than 100% as measured by
- 3 a Hot Creep test at a testing temperature of 150 degrees Centigrade.
- 4 3. The semiconductive power cable composition of Claim 1 wherein the high-
- 5 temperature polymer and the soft polymer have different heat resistance.
- 1 4. The semiconductive power cable composition of Claim 1 wherein the high-
- 2 temperature polymer is selected from the group consisting of polypropylenes,
- 3 polyesters, nylons, polysulfones, and polyaramides and the soft polymer is selected
- 4 from the group consisting of polyethylenes, polypropylenes, polyesters, and rubbers.
- 1 5. The semiconductive power cable composition of Claim 4 wherein the high-
- 2 temperature polymer is a polypropylene and the soft polymer is a polyethylene.
- 1 6. The semiconductive power cable composition of Claim 5 wherein the
- 2 polyethylene is a copolymer of a polar monomer and a nonpolar monomer.
- 1 7. The semiconductive power cable composition of Claim 1 wherein the
- 2 conductive filler is selected from the group consisting of carbon blacks, carbon fibers,
- 3 carbon nanotubes, graphite particles, metals, and metal-coated particles.
- 1 8. The semiconductive power cable composition of Claim 1 wherein the second
- 2 cable layer being chemically-crosslinked.
- 1 9. The semiconductive power cable composition of Claim 1, further comprising a
- 2 curing agent.
- 1 10. The semiconductive power cable composition of Claim 1 further comprising a
- 2 coupling agent.
- 1 11. The semiconductive power cable composition of Claim 10 wherein the
- 2 coupling agent reduces the amount of a curing agent required to impart heat resistance
- 3 to the semiconductive cable layer.
- 1 12. The semiconductive power cable composition of Claim 11 further comprising
- 2 a curing agent.

1 13. The semiconductive power cable composition of Claim 1 wherein the mixture
2 further comprises a compatibilizing polymer.

1 14. A semiconductive cable layer prepared from the semiconductive power cable
2 composition of Claim 1.

1 15. A power cable construction prepared by applying the semiconductive cable
2 layer of Claim 14 over a wire or cable.

1 16. A process for preparing a semiconductive power cable composition
2 comprising the step of:

3 blending a mixture of a high-temperature polymer, a soft polymer, and a
4 conductive filler,

5 wherein a semiconductive cable layer prepared from the composition strippably
6 adheres to a second cable layer.

1 17. The process of Claim 16, wherein the mixture further comprises a coupling
2 agent.

1 18. A process for preparing a semiconductive power cable composition
2 comprising the steps of:

3 a. reactively-coupling a mixture of a high-temperature polymer, a soft
4 polymer, and a coupling agent, in the presence of a conductive filler, wherein
5 the coupling agent reduces the amount of a curing agent required to impart
6 heat resistance to a semiconductive cable layer prepared from a mixture of the
7 high-temperature polymer, the soft polymer, and the conductive filler in the
8 absence of the coupling agent; and

9 b. admixing a curing agent,

10 wherein a semiconductive cable layer prepared from the composition strippably
11 adheres to a second cable layer.

1 19. A process for preparing a power cable comprising the steps of:

2 a. extruding a semiconductive power cable composition comprising a
3 mixture of a high-temperature polymer, a soft polymer, and a conductive filler,
4 over a metallic conductor to yield a semiconductive cable layer over the
5 metallic conductor; and

6 b. extruding a polymer-dielectric insulation over the semiconductive
7 cable layer.

1 20. The process for preparing a power cable of Claim 19 further comprising the
2 step of

3 c. extruding a second semiconductive power cable composition over the
4 polymer-dielectric insulation to yield a second semiconductive cable layer.

1 21. A process for preparing a power cable comprising the steps of:

2 a. extruding a power cable semiconductive composition comprising a
3 mixture of a high-temperature polymer, a soft polymer, and a conductive filler,
4 over a metallic conductor to yield a semiconductive cable layer over the
5 metallic conductor;

6 b. extruding a chemically-crosslinkable insulation composition over the
7 semiconductive cable layer;

8 c. extruding a second semiconductive power cable composition over the
9 polymer-dielectric insulation to yield a second semiconductive cable layer;
10 and

11 d. crosslinking the chemically-crosslinkable insulation composition to
12 yield a crosslinked, polymer-dielectric insulation.